THE AMERICAN ARCHITECT

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SHERBOURNE HOUSE CLUB
ROBERT SIMPSON COMPANY, LTD., TORONTO, CANADA
N. MAX DUNNING, *ARCHITECT*

The Work of N. Max Dunning

THE practice of architecture is of two classes considered as to its location. One may have his work confined to one locality, another may have his work widely distributed throughout the country. In the former case fellow architects and the public are familiar with his work and his position is well defined; in the latter this condition may not exist and then it is by assemblage that study and appraisal is possible. It is in this latter class that the work of N. Max Dunning, F. A. I. A., is placed, as his work is widely distributed, literally from Halifax to Los Angeles. Here are illustrated several examples of Mr. Dunning's work, indicating its scope and character.

The great mail-order corporations in America are but few in number. The two largest in the United States have their headquarters in Chicago and practically all of their buildings, including numerous large branch plants, have been designed by architects. The buildings of the great Canadian mail-order house, The Robert Simpson Company, Ltd., have been designed by Mr. Dunning. The main plant, located at Toronto, is characteristic of the branch houses located at Regina and Halifax. The Toronto building is eleven stories and basement in height and of sufficient ground area to present an imposing appearance. The greater portion of the wall surface is entirely composed of glass, excepting the spandrels. This scheme always presents a difficult problem for architectural treatment. The main exposed exterior structural members are made of concrete with brick paneled spandrels.

At each end of the principal elevation is a three bay pavilion, the center bay projecting. The vertical members are heavy and of substantial proportions, with an attendant reduction of the glass areas, provision for shadow effects, concentration of ornamentation and emphasized cornice. The three principal divisions of the elevation are well balanced, the extremely plain central area is relieved by the more pronounced end pavilions and withal a simplicity of designing which satisfies. The five story building at Halifax is designed with the same central portion of glass excepting the spandrels. In the Regina building, one half of which has been constructed, all of the vertical structural members are exposed. The corner pavilions are designed with great simplicity and effectiveness. This building of-

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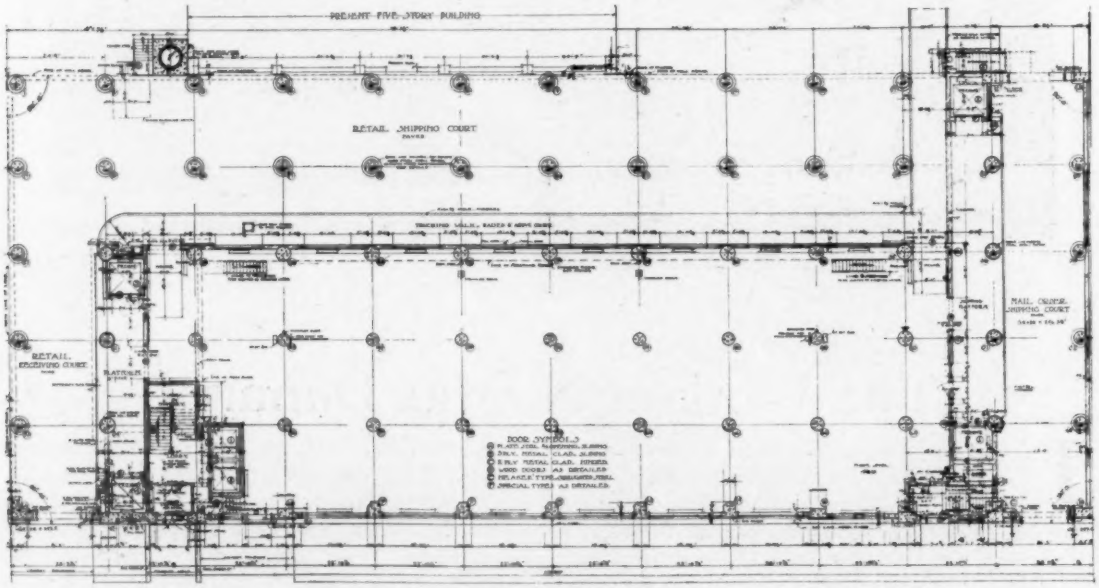
fers an excellent opportunity to compare the effect of the exposed vertical structural members with the buildings in which these members are behind the windows.

In connection with the Toronto project a dormitory building was erected to house the female employees of The Robert Simpson Company, Ltd., and the surplus accommodations allotted to art and other students. It is quite an extensive building but the funds available limited its design to service only and with little attempt to secure exterior architectural effect. The dormitory was constructed at the rear of extensive grounds surrounding an old mansion on Sherhourai Street. The residence was remodelled

cers are located on the first floor, the general offices on the second floor and in the basement are the multigraphing, stationary, mailing, filing and exhibit rooms. In addition there is a men's and women's lunch room with kitchenette, a nurse's, examination and quiet rooms for the social service department; barber shop, shower baths, boiler and fan rooms; large vaults are provided on each floor.

The Stromberg Motor Device Building, Chicago, has a special roof construction over the sixth story which is used as a brass foundry. A description of this roof was published in THE AMERICAN ARCHITECT, Sept. 1, 1920, page 291.

To adapt a plan to an irregular shaped area is al-



FIRST FLOOR PLAN
BUILDING FOR ROBERT SIMPSON CO., LTD., TORONTO, CANADA
N. MAX DUNNING, *ARCHITECT*

and with the extensions provides the occupants of the dormitory with reception rooms, club rooms and grounds, comprising a most satisfactory plant.

The buildings of the National Cloak and Suit Company at Kansas City, Mo., are designed along similar lines. The plant is being constructed in sections with detached power house. Ample ground space permits the arrangement of complete railroad and vehicular transportation service. The office building for the Simmons Manufacturing Company at Kenosha, Wis., is a good example of the modern detached office building of a large manufacturing company. The private offices of the executive offi-

ways an interesting problem, especially when the floors are divided for different purposes. The Hotel Winton faces two streets which are not parallel and an adjoining property cuts out a corner on the rear. Being located on inside lots it was necessary to use three courts to provide light to guest rooms. The typical floor plan shows a large number of rooms equally well lighted. The public rooms are in the basement, first and mezzanine floors. The power plant and laundry are located in an adjoining building. The lobby, lounge and various dining rooms are large, well proportioned and very conveniently arranged. The decorative details are generally in

low relief and simple. The colors applied and the woods and marbles used are quiet in tone and very harmonious. The principal elevation is of a red brick and light colored terra cotta. There are no extreme projections in any of the parts and the satisfactory impression produced is due to the disposition of the well proportioned openings and the well placed horizontal members.

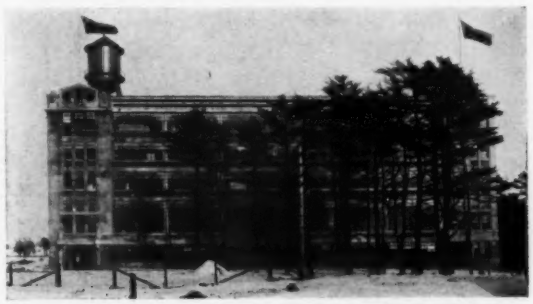
The Bethany Bible School is designed to be a complete institution in which there are provided dormitories, lecture halls and a chapel. The buildings are arranged about a city block with a large quadrangle in the center. These buildings were erected during

BUILDING FOR ROBERT SIMPSON CO., LTD.,
MUTUAL STREET, TORONTO, CANADA
N. MAX DUNNING, *ARCHITECT*

a period of years and are of sufficiently varied design to present an interesting appearance.

The building of the American Book Company, Chicago, is a very substantial and well proportioned structure. The offices are located in the top story and the balance of the building used for the storage of books, shipping and receiving departments. The exterior is faced with a rough faced red brick combined with very simple and effective terra cotta sills, caps and belt courses. The designing is simple, slight projections of the vertical members, the heavy projections of the belt courses and deep window reveals provide excellent shadow effects. The treatment of the first and fifth stories provides the needed additional surface effects. In the tower are placed the sprinkler and house service tanks.

Among other buildings designed by Mr. Dunning



BUILDING FOR ROBERT SIMPSON CO., LTD.,
HALIFAX, NOVA SCOTIA
N. MAX DUNNING, *ARCHITECT*

are the Dixon National Bank and the Dixon Home Telephone Company buildings at Dixon, Ill.; the Kenosha Hospital and the Newell Memorial Chapel at Kenosha, Wis.; the Fourteenth Church of Christ, Scientist, and the Oak Park Baptist Church, designed in association with C. A. Jensen and E. E.

BUILDING FOR ROBERT SIMPSON CO., LTD.,
REGINA, SASKATCHEWAN. VIEW TAKEN
DURING CONSTRUCTION
N. MAX DUNNING, *ARCHITECT*

Roberts, respectively. Of the residences designed by Mr. Dunning, that of Mr. Robert J. Thorne at Lake Forest, Ill., is the most important. This was designed in association with John W. McKecknie

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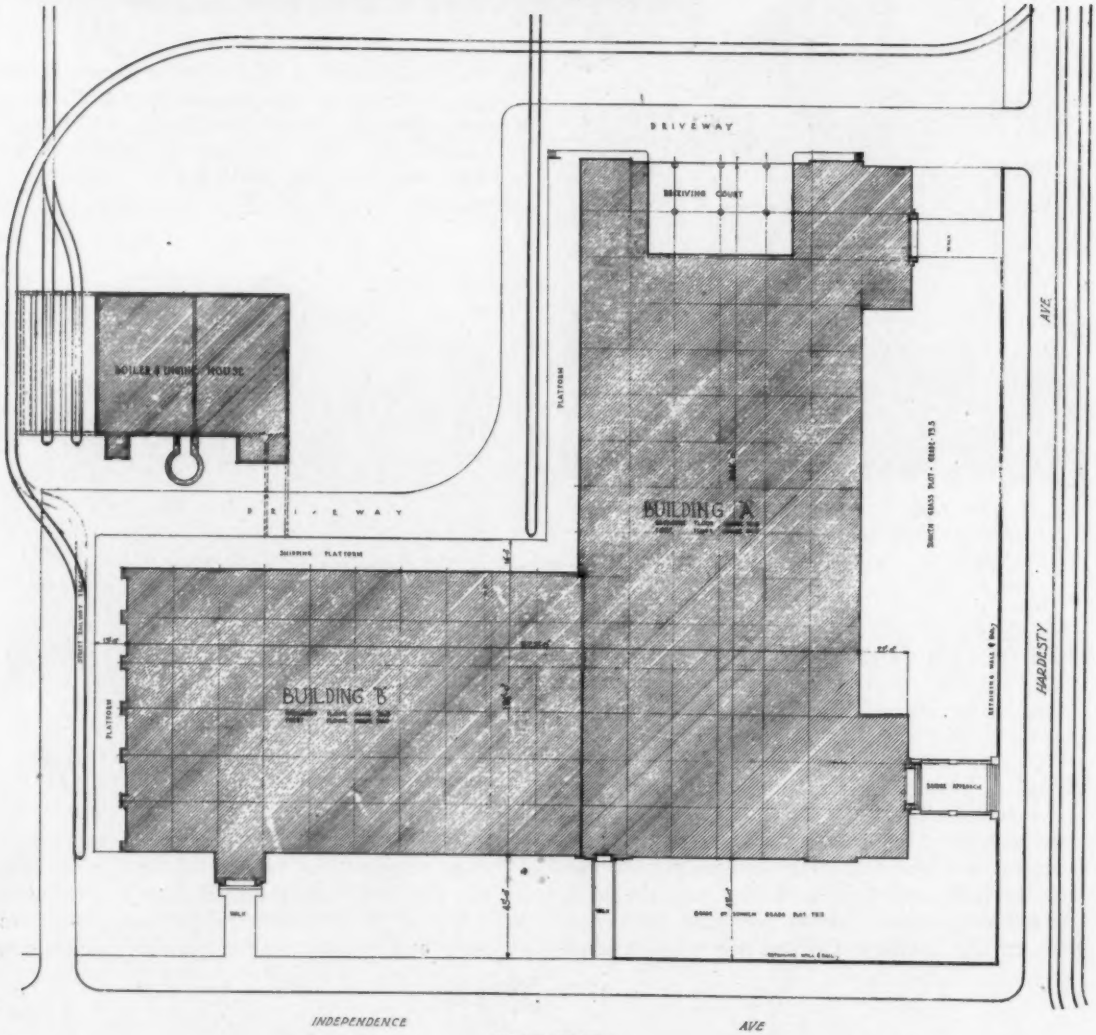
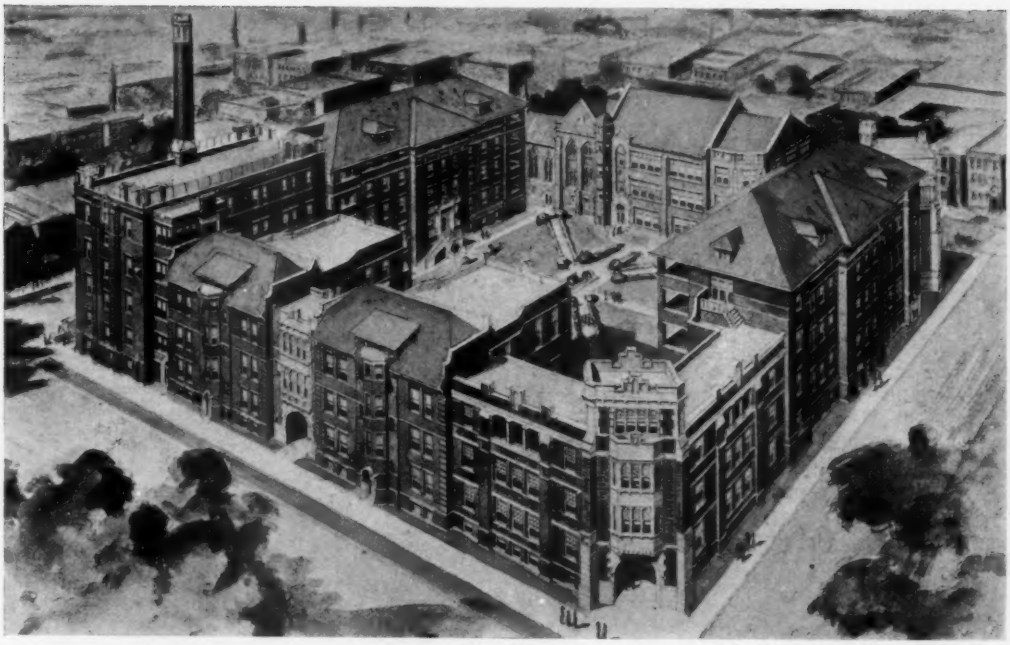
BUILDING FOR
NATIONAL CLOAK AND
SUIT COMPANY
KANSAS CITY, MO.

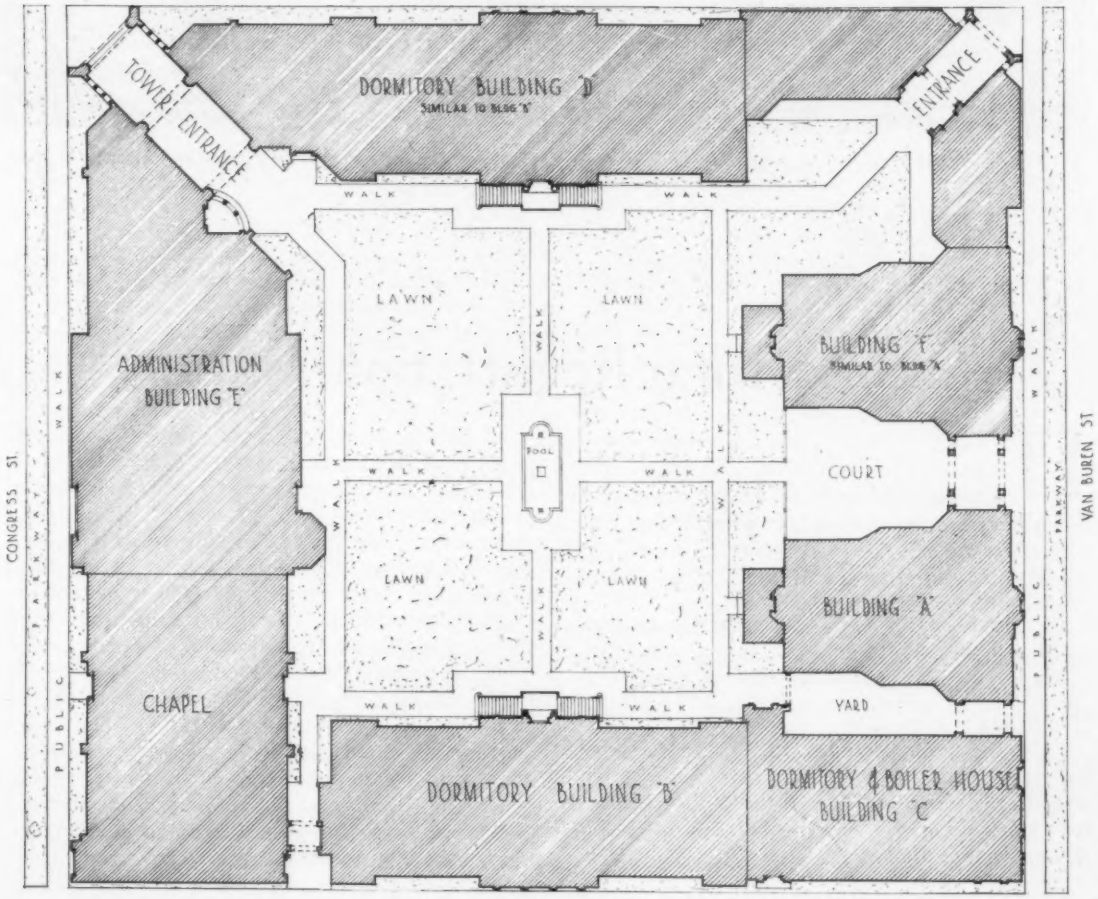
N. MAX DUNNING,
ARCHITECT



PLOT PLAN



BIRD'S-EYE VIEW



PLOT PLAN

BUILDINGS FOR THE BETHANY BIBLE SCHOOL, CHICAGO.

N. MAX DUNNING, *ARCHITECT*

of Kansas City. These it is proposed to illustrate in succeeding issues.

It is apparent that the basis of Mr. Dunning's designs is a careful study of the elementary requirements of the project. On these is erected the design in a simple and logical manner, with careful consideration being given to the materials employed. There is no striving for effects not consistent with the requirements of the building, neither is there evidence of adaptations from other works. Simplicity, charm and dignity characterize the work as they are characteristic of the designer.

OFFICE BUILDING FOR SIMMONS MANUFACTURING COMPANY, KENOSHA, WIS.
N. MAX DUNNING, *ARCHITECT*

Architectural Registration Matters

HAVING received from E. I. Du Pont De Nemours & Co., Inc., of Wilmington, Del., certain inquiries as to the various states in which there are registration laws or other legislation controlling the practice of architecture, we referred the letter to the secretary of the National Council of Architectural Registration Boards.

The reply to this letter was so thoroughly prepared that we are presenting it herewith in the belief that it will be of wide interest:

"Gentlemen:

"Your letter of December 16, 1920, addressed to the Architectural & Building Press, Inc., 243 W. 39th street, New York City, has been referred to me for reply by Mr. W. H. Crocker, editor of THE AMERICAN ARCHITECT.

"A list of the states having laws regulating the practice of architecture is regularly published in the *Journal* of the American Institute of Architects, see latest list, December, 1920, page VII. The requirements of the laws in the different states vary greatly. A digest of these laws would involve labor so extensive, that I am sure that you would not expect anyone to furnish you with such information without adequate remuneration.

"On November 18 and 19 there was held in St. Louis, Missouri, a meeting of the registration officers of the various states having registration laws. And there were in attendance at this meeting representatives from seventeen states out of the twenty having registration laws. And there were also present representatives from a considerable number of states which have laws pending in their respective legisla-

tures. As a result of this conference, which lasted two days, the meeting unanimously resolved to form a National Council of Architectural Registration Boards, which, among other duties, should act as a clearing house for information regarding architects who might desire reciprocal transfer from one state to another.

"I am enclosing copy of Constitution and By-Laws of this organization, and beg to say that the organization will be completed and ready to function on or about the second of January, 1921. This organization will be able to offer a great convenience to architects doing interstate business. Of course, as it is purely a voluntary organization, and no state board can surrender its function under the various state laws, it must depend for its value largely upon the spirit of co-operation, which was manifest in the council meeting held in St. Louis.

"One may be entitled to practice architecture under the registration laws in a particular state and not entitled to transfer to another state, due to the stringent requirements of the laws in the state to which the architect desires transfer. To eliminate this difficulty and avoid taking a number of examinations, the council proposes to issue a standard N. C. A. R. examination, which when one has taken will be deemed sufficient evidence of competency to entitle that person to registration in any state in the United States; due to the fact that the standard N. C. A. R. examination questions will require the candidate to pass an examination at least equivalent to the requirements of every state in the United States. I would strongly recommend every architect who expects to engage in interstate business to prepare and take the standard N. C. A. R. examination.

"It is expected that these examinations will be given by the state examining committee in the state where the man resides or in the state nearest to his residence. But the questions will be prepared by the National Council. The procedure will be about as follows:

"The applicant for a standard N. C. A. R. examination will file a fee of twenty-five dollars and apply to the National Council of Architectural Registration Boards for a standard N. C. A. R. examination, and will designate the state nearest his residence where he wishes to be examined. The council will then investigate the examination requirements of that particular state and prepare additional questions to cover the requirements of other states in addition to the requirements of that state, make an investigation of the applicant's record in practice, certify to same and turn over to the officials where the applicant wishes to be examined. The applicant will then file an application for examination in the state where he wishes to be examined, stating that he wishes to take a N. C. A. R. standard examination. He will then appear before the local state committee and take the regular state examination and the additional N. C. A. R. examination; and if successful in the examination, the local state examining committee will certify that he has passed the state examination, also the standard N. C. A. R. requirements.

"A certificate of this kind and an application from the National Council of Architectural Registration Boards will entitle the applicant to registration in any state in the United States upon the payment of fees without appearing or examination, provided he keeps his record clear as to honesty, integrity and discreet caution in practice. Thus a competent architect may dispose once for all of examination requirements. Should an architect not wish to take the standard N. C. A. R. examination, but wish to be transferred from one state of registration to another state of registration, his procedure would be about as follows:

"He would apply to the National Council of Architectural Registration Boards for an application blank and pay a fee of fifteen dollars, fill out this application blank and return to the National Council. The council would then carefully investigate his record of practice in the state where he resides or in any other state where he is registered to practice. This would include correspondence with his clients, the local architectural societies, fellow architects and a transcript of his record with his own state examining committee. This material, carefully collected, collated and certified to, would be transferred by the council to the registration officials of the state where he wishes to enter practice and would be used by the examining committee of that state as evidence to determine his eligibility for registration in that state. If his previous examination was equal in standard to the state where he wished to be transferred and his record in practice without blemish, he would in all probability be granted a certificate showing his right to practice architecture in the state receiving the report of the council. And would thus be saved the time, expense and delay of a personal appearance at an examination in the state in question. Should he fail in the examination in question and so desire, the council would refund his application fee. Should he wish to be transferred to still another state, he should file an application for additional transfer to the council and pay a fee of five dollars, upon which the council would investigate his record during the interim between his former investigation and the time of second application, make a transcript of his complete record and transmit to the additional state where he may desire registration. And this procedure would be followed in as many transfers as the applicant might wish to make.

"In the case of an architect who had received regis-

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tration in the state where he resided on account of the 'exemption clause' and because of years of practice at the time the law went into effect, he would not be entitled to registration in another state without examination, as no other state would be under legal obligation to accept him without examination. In consequence, architects who have received registration under the 'exemption clause' are urged to waive that right and be registered in their home state by examination. The council is recommending that in all such cases the form of examination for architects of ten or more years' independent practice of the profession of architecture as principal in charge of an architectural office, that these architects be given a special examination by exhibits in which they shall submit to the examining committee plans, specifications and detail of a number of their more representative buildings and appear before the committee with these exhibits, answering such questions as shall be put to them tending to indicate that they were the real authors of the work, notwithstanding the fact that the drafting and clerical work may have been executed by others under their supervision. And if, in the judgment of the examining committee, they show a record in practice indicating competency equal to or in excess of the competency that might be indicated by a written examination prepared in accordance with the law, they should certify to the proper authorities their right to registration by examination.

"Architects of ten or more years' practice residing in states where there are no laws regulating the practice of architecture should take such an examination as above indicated in the state having registration laws nearest to where they reside.

"E. S. HALL, Secretary,
"National Council of Architectural Registration
Chicago Boards."

HOUSE OF F. W. PENFIELD, GLENCOE, ILL.
N. MAX DUNNING, *ARCHITECT*

American Specification Institute

We are heartily in favor of the movement suggested in your editorial of November 17. Such an organization as "The American Specification Institute," whose object should be to increase the knowledge of its membership, in relation to the preparation of definite specifications, should receive the hearty support of every practicing architect.

Your editorial in November 17, of THE AMERICAN ARCHITECT speaks the truth in relation to altogether too many specifications when you charge that "The preparation of specifications receives less study and attention in proportion to their importance than any other phase of architectural or engineering practice."

The growth and development of the very complicated work of the present day architect calls for the fullest development of every branch of his service. Heretofore much effort has been put upon the development of carefully wrought drawings and details covering all the various parts of the work. This is as it should be, and in so doing the architect has kept pace with the almost abnormal requirements. The work of preparing the specifications was pushed aside as of not much importance; however, it has been found that as a companion of complete and accurate drawings which together form the basis of every contract, the specifications should have the same careful consideration and be prepared by those experienced and skilled in specification work.

As the work under the care of the architect becomes more and more complicated and important, the necessity of perfect (if possible) specifications will be more and more apparent.

Too often the specifications only meant so many typewritten pages to be discarded by the builder because of their discrepancies and meaningless and impossible requirements, indicating a lack of knowledge of good construction principles, the proper use of materials and equipment.

Specifications should be accurate and definite the same as is required of the drawings.

SAMUEL HANNAFORD & SONS.

Cincinnati, O.

Replying to your letter of November 24, I have been greatly interested by your editorial of November 17, on the American Specification Institute. Specification writing has undoubtedly lagged far behind the advancing standard of architectural practice generally. Your proposal to give prominence to this work is exactly in the right direction.

JOHN GALEN HOWARD.

San Francisco, Cal.

I concur in almost every detail with your editorial and feel that there is need for a better set of specifications than is now adopted by the average architects' offices, and it appears to me that the formation of a specification institute would be a much needed service that can be rendered to architects.

G. LLOYD PREACHER.

Augusta, Ga.

We are in receipt of your letter of November 24 asking our opinion of The American Specification Institute.

We cannot entirely indorse the statement that the specifications are the least creditable part of an architect's production. The object of both drawings and specifications is to form a definite basis for estimating and construction, and in our experience questions arise due to the defects in one as much as the other. It is axiomatic that better information and education are desirable.

As to The American Specification Institute, however, your article does not give sufficient particulars on which an opinion may be formed. Is this an association of specification writers? If so, who is getting it up? What are the objects and how may membership in it be obtained? We should be glad to receive further information on the subject.

CARRERE & HASTINGS.

New York, N. Y.

In answer to yours of November 24 in regard to the American Specification Institute, I am much interested and would like to know more about this.

I thought that our Structural Service Committee of the American Institute of Architects was doing this work and doing it well. At present I see no reason for a rival organization.

I await your next letter with interest.

H. J. CARLSON.

Boston, Mass.

Your letter of November 24 referring to editorial of November 17 received, and we are glad to inform you that we heartily approve of the plan.

Whether the formation of an institute is the ideal thing to do we are unable to state, but some good, sound articles on specification work, in your magazine, will certainly be of great value to every architect.

MALCOMSON, HIGGINBOTHAM & PALMER,
per C. WM. PALMER.

Detroit, Mich.

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Old State House, Newport

(See reproduction of original drawing by O. R. Eggers on opposite page)

The public buildings designed during our early Colonial period are, in general, excellent in design.

While simple in style they have a certain elegance that may properly furnish inspiration to modern builders. It is in its disciplined and almost universal refinement and dignity that lies the chief beauty of this work. Even when the early builders sought to venture on display they seemed to possess an innate sense of good breeding which taught them to avoid the vulgar and the eccentric.

This rugged refinement is shown in the fact that classic detail was a common language, and even the humblest carpenter was able to use it with intelligence and appropriateness to express the joy he evidently found in his work.

*The State House at Newport was built in 1743, and Richard Munday was its architect. Olaff C. Revin, writing in the Georgian period of Munday and his work, states: "This building is symmetrical, well proportioned and quiet. For suggestion Munday depended on the type then in vogue. * * * The dimensions are forty feet by eighty. Honestly constructed of brick and stone, it bravely promises to weather the seasons for many generations to come."*

Some critics of the architecture of our Colonial period have contended that, while its purity and classic beauty cannot be questioned, it was nevertheless based purely on domestic types. This State House at Newport is cited as a case to prove this contention.

OLD STATE HOUSE, NEWPORT, RHODE ISLAND
THE AMERICAN ARCHITECT Series of Early American Architecture

LIBRARY
THE DETROIT EDISON CO.
FEB 9 1921

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EDITORIAL

Ignoring Our American Art

ELSEWHERE in this issue there appears a news item stating that Frank Brangwyn, the English painter and etcher, has accepted a commission to decorate the dome of the state capitol in Jefferson City.

The Missouri press, seeing only the obvious result, passes by the deeper, more subtle one, and enthusiastically congratulates Missouri on its selection of an artist.

We do not challenge Mr. Brangwyn's competence to carry forward the work in hand. He will doubtless undertake it with that same spirit and skill which has been at the base of his success. But the question must be asked, why was this important work not assigned to some American artist. It would have been an opportunity that might with advantage to American art have been availed of, for if the American spirit is to prevail anywhere, surely an American capitol building would suggest itself.

American art will be slow to arouse world interest if Americans themselves give such evidence of lacking confidence. If America herself is indifferent to her genius, where can she hope for the respect she craves from the old, sophisticated nations across the seas? Why should the decoration in an American capitol building express the feeling of one whose traditions have nothing in common with American traditions and whose work is necessarily colored by other and foreign ideals? This great country is not without its genius, but genius needs to be appreciated. It is an injustice to American artists to deny them the opportunity for service. It is against the spirit of American art to assign so typically American a commission to one without "America first" in his heart. It is against the interests of America to ignore its home product and go so far afield for talent.

This country is famous for the way it has advertised its own powers. It has developed its resources, encouraged its commerce, cheered and boosted everything American. It would seem a duty for those in charge of art matters to do their part to stimulate American art also and help it to those heights which give us pride in other things American.

Where Does the "Evil" Lie?

THE *New York American* of February 14 printed a long and misleading editorial on the "evils" of the so-called Esch-Cummins law. "Each day," this newspaper stated in a headline, "Reveals New Evil in the Esch-Cummins Law."

Now, there is much that is good and much that is bad in that editorial. It is of vital interest to every architect in the country, because an architect's bread is buttered by no one factor more than efficient transportation. The so-called Calder Committee (the Senate's Special Committee on Reconstruction and Production) very clearly proved that. Housing all over the country progressed or stopped in direct ratio to the effectiveness of the transportation facilities to and from any given point. This, of course, was a self-evident fact before the investigation was begun by the Committee. Whatever Senator Calder and his colleagues unearthed merely substantiated a fact of which all architects were only too well aware. In any industrial scheme as complex as ours, transportation necessarily must play one of the most important parts.

Knowing that, architects should be, and undoubtedly are, familiar with the provisions of the Esch-Cummins law. The point most at issue just now is the recent contracts which the private managers have made with private repair companies for the repair of locomotives and cars. It is contended that the railroads have always maintained their own repair shops, and have kept the accounts of the average costs of repairing engines and cars. This average cost was between $4,000 and $5,000 for a locomotive, but today the repairs are said to cost about $20,000 per locomotive, due to the fact that the repairs are done by private companies, not directly connected with the railroads, but "controlled" by the financial interests which maintain the Class 1 railroads [the Pennsylvania and other large systems].

If this be true, the railroads are most certainly at fault and should be made to continue their repairs under the old scheme, because under this new arrangement, the total cost of repairs to locomotives and to cars is more than $750,000,000 a year.

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THIS would be all right, if the railroads themselves met this huge expense. But they do not meet it. The Esch-Cummins law provides that the stockholders of the railroads shall have 6½ per cent. dividends, but under the "guarantee" system and the high rates made necessary to meet that arbitrary dividend, the American people must pay out more and more until the 6½ per cent. level is reached.

If all these charges are true, and if it is actually found that the repair factor in the operation of American railroads is being artificially and deliberately increased because of a desire to profiteer, then the officials of whatever railroad companies are involved in such practices should not only be *compelled* to explain every detail, but also to go back to whatever order of things is best suited for rigid economy.

As indicated above, this is of extreme importance to every architect. Everything that goes into any building or arch or memorial or anything else is directly affected by the cost of transportation. The price and the availability of the smallest nail, as well as of the largest beam, are both immediately and directly affected by the efficiency of the transportation facilities of a community.

Now, where does the "evil" lie?

You will find this journal's answer to that question in our next issue.

The Holy Land in 1920

NEITHER stuffy tenements nor dirty factories, narrow streets nor sullied slums will be tolerated in Jerusalem and other urban centers of Palestine, "the Jewish Homeland."

Anticipating a heavy influx of Jews back to the Holy Land, a city and town planning commission has been appointed to regulate the distribution of population, and prevent a mushroom growth from spoiling forever the beauty of the ancient cities.

All town plans will have to be approved by the commission. Civic commissions with full authority will control building development in Jerusalem, Jaffa, Haifa and Tiberias, working on plans approved by a central commission. This body may be headed by Sir Patrick Geddes of the University of Edinburgh, town-planer of Bombay and other cities of India. Landowners have been advised to consult with the local commissioners before attempting new construction.

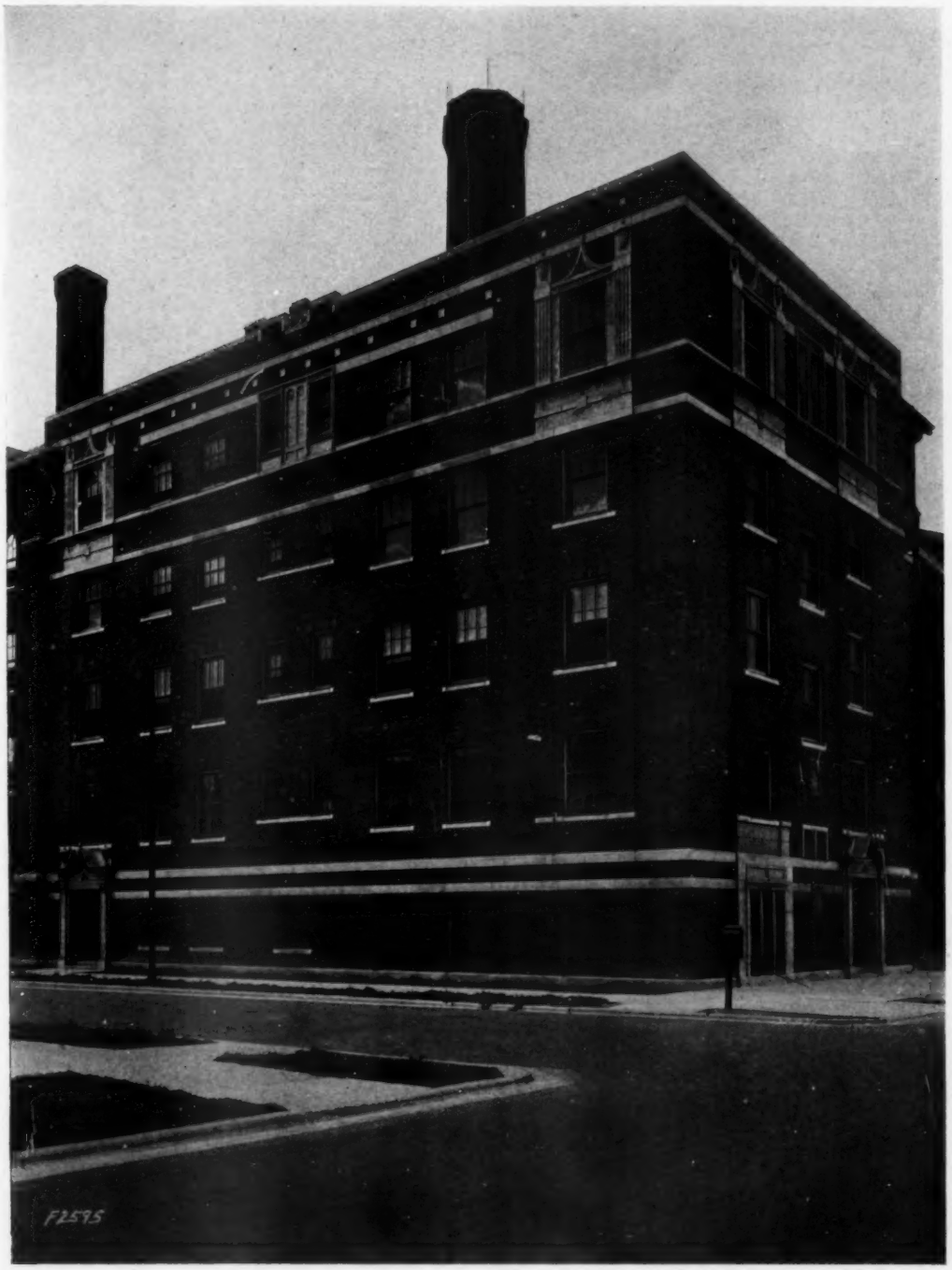
Palestine is now half empty and there is ample room for new communities and modern quarters. In building them the poor must not be huddled in crowded settlements while the rich enjoy spacious houses and delightful gardens.

It is the duty of the government to supervise such things. It is hoped to have here noble cities with parks and open spaces, designed, not in the foreign extraneous style, but breathing the spirit of the land, representing the best ideals of those who work for its upbuilding.

IT is interesting to learn that concessionaires have applied to General Ronald Storrs, governor of Jerusalem since the city was captured by Lord Allenby, for permission to run a street car line to the Mount of Olives and an interurban to Bethlehem. There is a shock in the news; it seems like some of the more objectionable fooling in "Innocents Abroad," but it is a sober fact. Remembering that Palestine, the Holy Land and the center of the religious aspiration of so large a part of humanity, is still an ordinary inhabited country with citizens who want to do business and manage their affairs like other communities, serves to give some idea of the difficulty of the task of the British governor. Drinking bars have been forbidden in the city; the street railways to the holy places have been refused franchises; modern building of all sorts is forbidden, as the feeling is that the country should preserve as much of its patriarchal look as can be saved.

The conflict between historical and artistic interest and the economic development of a country is an ancient one. Italy suggests itself for comparison, and seems to show that compromise is possible. The Italians developed their industries as much as they could, but still with attention to the tourist values, the only thing, incidentally, that enabled the Italian nation to come through each year with a credit balance on the national books.

BUILDING FOR NATIONAL CLOAK AND SUIT COMPANY, KANSAS CITY, MO.
N. MAX DUNNING, *ARCHITECT*



DORMITORY "C" AND BOILER HOUSE
BETHANY BIBLE SCHOOL, CHICAGO
N. MAX DUNNING, *ARCHITECT*

DETAIL, COURT ENTRANCE, DORMITORY "B"
THE BETHANY BIBLE SCHOOL, CHICAGO
N. MAX DUNNING, *ARCHITECT*

ENTRANCE DETAIL

OFFICE BUILDING FOR SIMMONS MANUFACTURING COMPANY, KENOSHA, WIS.

N. MAX DUNNING, *ARCHITECT*

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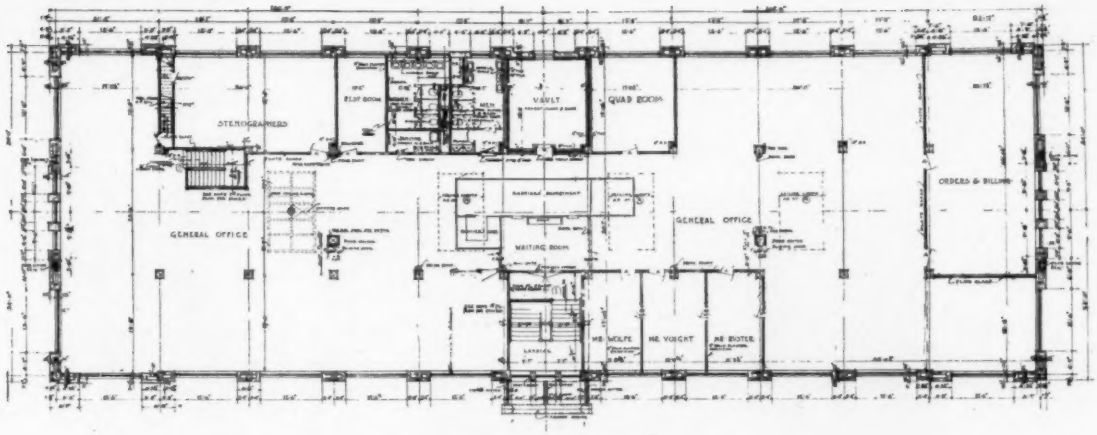
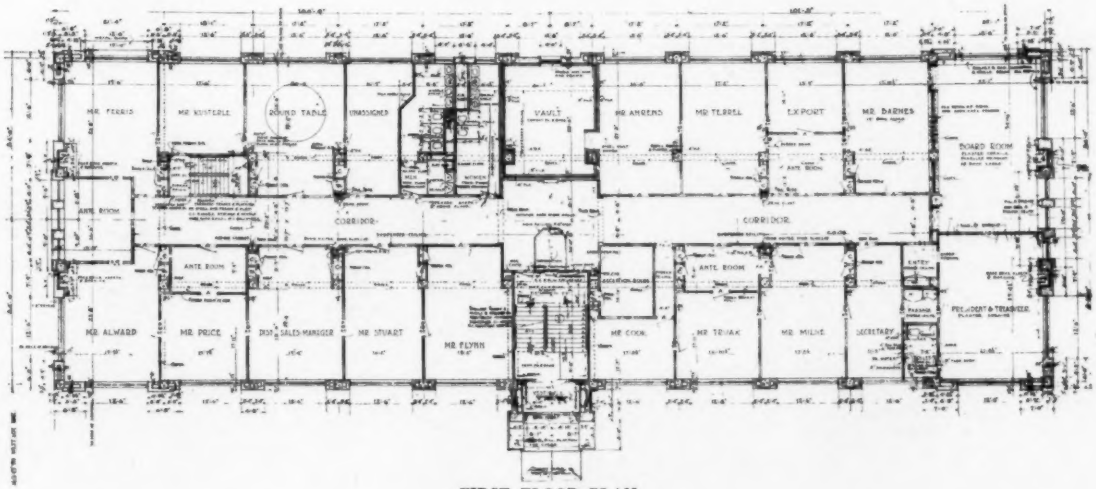
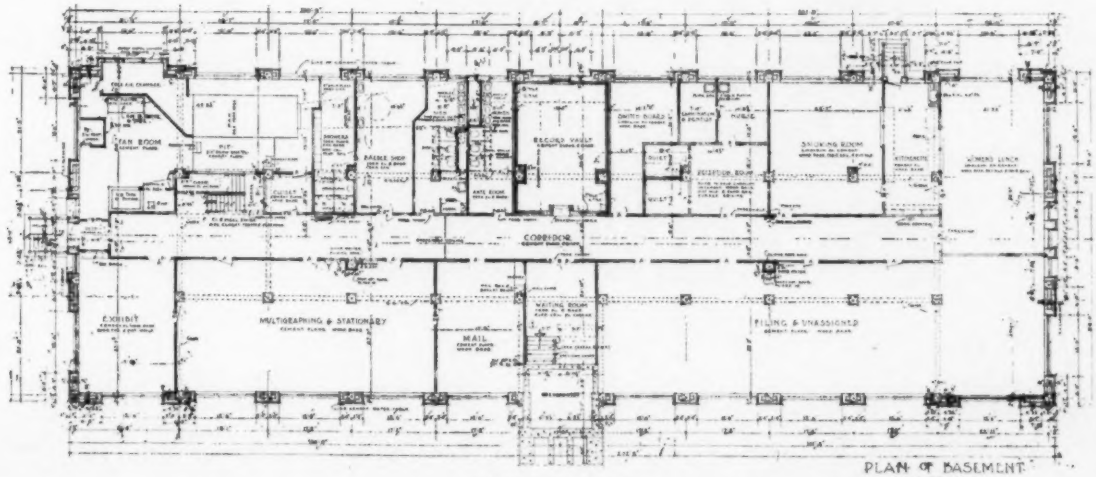


SECOND FLOOR PLAN



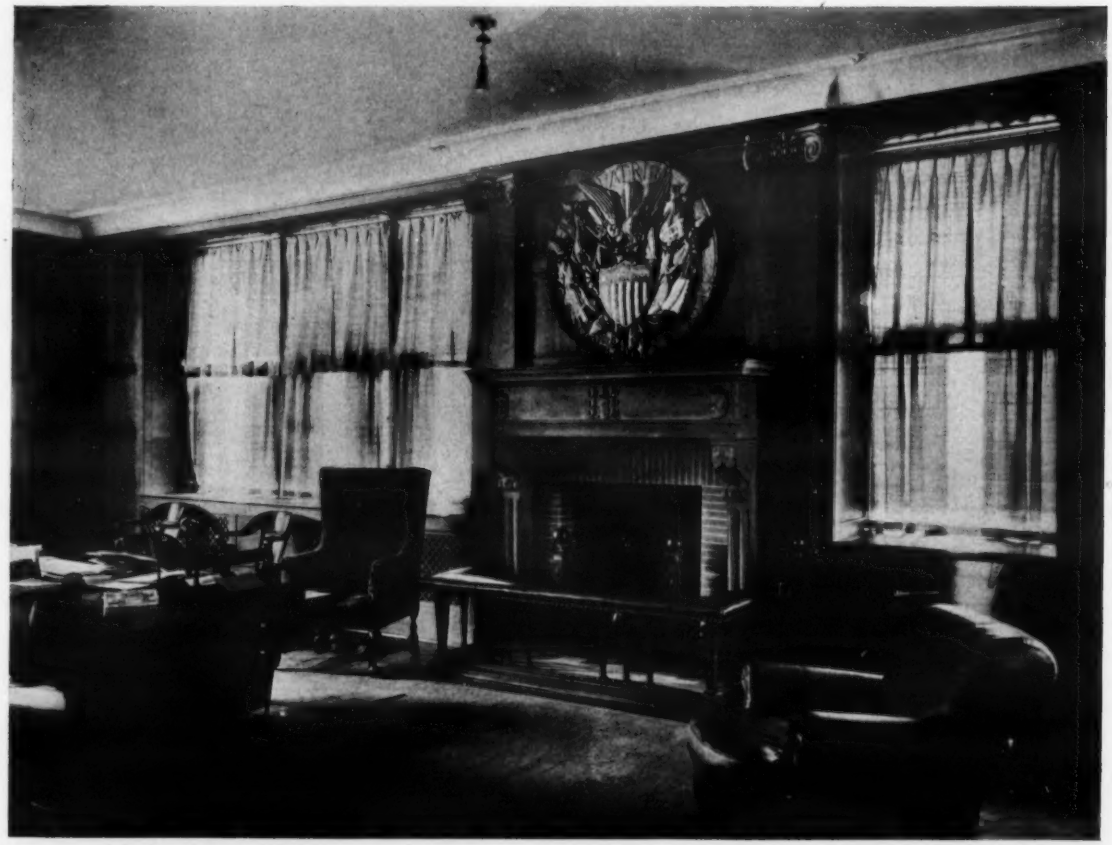
FIRST FLOOR PLAN



BASEMENT PLAN

OFFICE BUILDING FOR SIMMONS MANUFACTURING COMPANY, KENOSHA, WIS.

N. MAX DUNNING, *ARCHITECT*



BOARD ROOM

OFFICE BUILDING FOR SIMMONS MANUFACTURING COMPANY, KENOSHA, WIS.

N. MAX DUNNING, *ARCHITECT*

HOUSE OF ROBERT E. WARD, WILMETTE, ILL.

HOUSE OF F. C. TRAVER, KENILWORTH, ILL.
N. MAX DUNNING, *ARCHITECT*

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POWER HOUSE—PHILADELPHIA ELECTRIC COMPANY, PHILADELPHIA, PA.
The coal unloading tower is seen to the right

Steel Sheet Piling

Application, Design and Methods of Construction in Foundations

By CHARLES S. BOARDMAN

STEEL sheet piling has found application in foundations in many ways. Its growth has dated from its first use as curtain walls driven along the foundations of buildings adjacent to new foundations requiring deeper excavations for the purpose of holding securely the foundations of old buildings and materials under them. This use has now developed so that sheet piling has found successful and growing application in underpinning of these older foundations of adjacent building and in underpinning the building foundations along route of subway construction. Its next application was in general cofferdam work surrounding a building site or in small pier cofferdams to unwater these areas in which to construct the foundations as planned. This application of this type of piling to foundation work is generally understood.

During twelve years of study in the design and development of sheet piling, however, the possibilities of its use in deep open cylindrical cofferdams or caissons for building pier foundations as well as for bridge pier and other deeper foundations have been very apparent. The progress in this direction, however, has been slow, due to the necessity for a complete change and for abandoning old plants and erecting new plants for a method the merits of which were not thoroughly understood.

It is not uncommon now in bridge pier design

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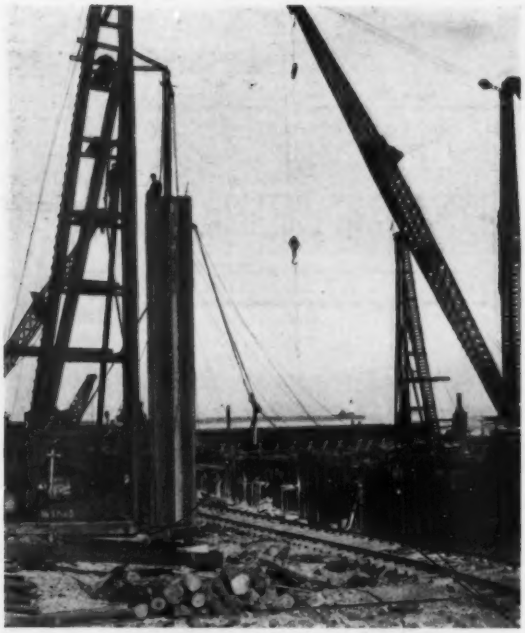


METHOD OF USING PILE DRIVER RIG
Steel pipe holds cylinder of piling vertical for driving

to make pier excavation in open cofferdams of steel sheet piling, seventy to ninety feet in depth, using telescopic cofferdams of two or more leaves, each leaf of thirty to fifty-foot lengths of sheet piling. Single pieces fifty to seventy-five feet long have been used in a number of instances in various construction jobs. It has also been demonstrated by improved methods of installation, and by assembling the piling in wall form, splicing piles for longer lengths is entirely practicable.

Experience has thoroughly demonstrated the water tightness of single wall sheet piling, both straight and circular construction, by side contact or by compression and side contact.

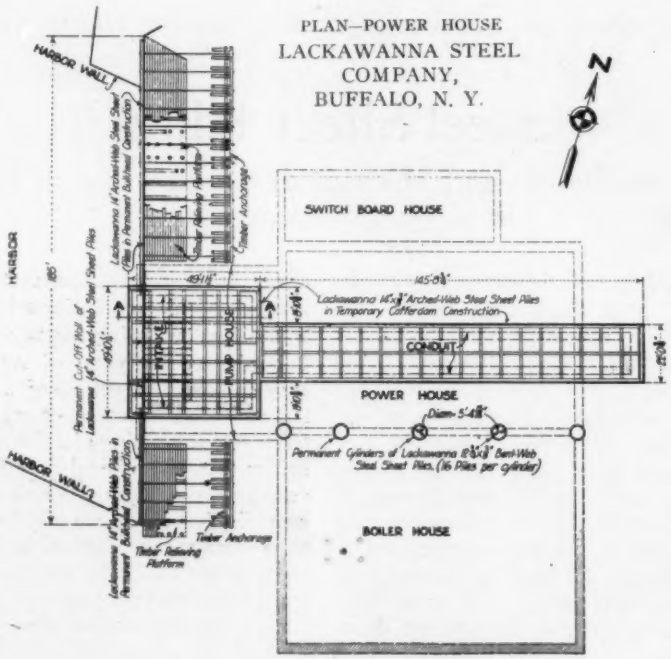
A preconceived plan and method in building pier foundations in open caissons of steel sheet piling, as in other types of building foundations, is necessary, particularly in large power house foundations. The Buffalo General Electric Company's River Station, Buffalo, N. Y., and the power house of the Philadelphia Electric Company, at Philadelphia, Pa., and part of the foundations of the new power house, Lackawanna Steel Company, Buffalo, N. Y., were constructed by this method, using Lackawanna steel sheet piling.

The new power plant of the Lackawanna Steel Company, Buffalo, N. Y., recently completed, has an interesting foundation, inasmuch as steel sheet piling was used in four distinct and separate applications.

This power house was constructed on a site previously excavated for a canal slip in Buffalo Harbor to 23 feet of water. The materials as shown by a cross section below were mud and silt, sand and gravel and hardpan to rock.

This foundation required first a single-wall braced cofferdam within which to construct intake and pump well. This required 14 x ⅜-in. arched-web Lackawanna steel sheet piling, 44 ft. in length.

This cofferdam was constructed by first excavating the remaining materials from the slip. The bearing piles were driven and followed to grade and the cage of bracing was framed, the bottom tier first and building upon this until complete, allowing the cage to sink of its own weight. Additional weight sunk cage to water level. The piling was then assembled around the perimeter of this cage and the closure pile set when all the steel sheets were driven. The steam pile driving hammer was suspended from end of derrick boom. Upon placing of pumps the cofferdams were ready to be pumped out.

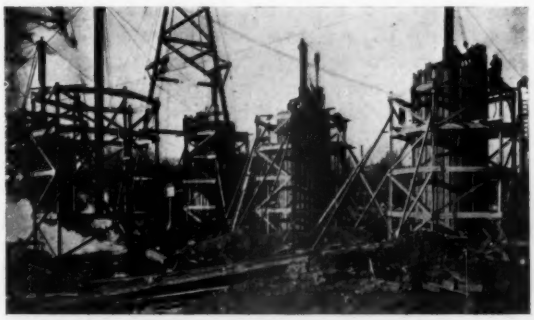


This improvement also required a bulkhead or dock wall adjacent to and on both sides of power house to hold in place soft materials and a fill place to bring the site to yard level. The bulkhead required 14 x ⅜-in. arched-web piling, 53 ft. in length.

To make bulkhead continuous, a cut-off wall of 14 x ⅜-in. arched-web piling about 22 ft. long had to be constructed under the intake well. This was accomplished by driving piling in the cofferdam after it was unwatered and by moving one timber in each of four tiers of braces at one time.

Since the loading on partition wall between power house and boiler house was heavier and since the foundation was also in canal slip area, five cylindrical piers to bedrock were needed. These were constructed within walls of 14 x ⅜ in. arched-web piling, 42 ft. in length.

The method of constructing these cylinder piers



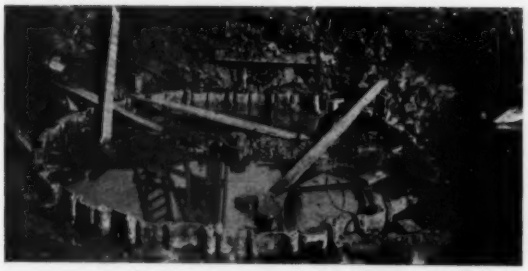
CYLINDERS ASSEMBLED FOR DRIVING

Cylinder at the left has been driven

here used differed only in that a fixed leader pile driver rig was blocked in position to hold the mast vertical. The method of doing this will be described later.

The building is approximately 240 x 223 ft. in plan, with a floor level about 40 ft. above bedrock and about 5 ft. above water level. A series of bore holes developed that bedrock lay almost horizontal and about 35 ft. below the surface of the ground. From 5 ft. to 7 ft. of mud and silt, 25 ft. to 28 ft. of sand or quicksand, and 3 ft. of clay, containing large gravel and small boulders, lay on the rock.

The plan called for 157 cylinder piers varying in diameter from 33 to 81 inches. The maximum compressive stress allowed anywhere on the reinforced concrete was 500 pounds per square inch. The larger piers carry as high as 874 tons per pier. These foundations were constructed in open cylinder caissons of steel sheet piling, 12¾ x ⅜-in. straight-web and bent web sections being used.



CLOSE-UP OF CYLINDER AFTER DRIVING

Excavation has not been started

CYLINDER DIAMETERS FOR BENT-WEB PILING.

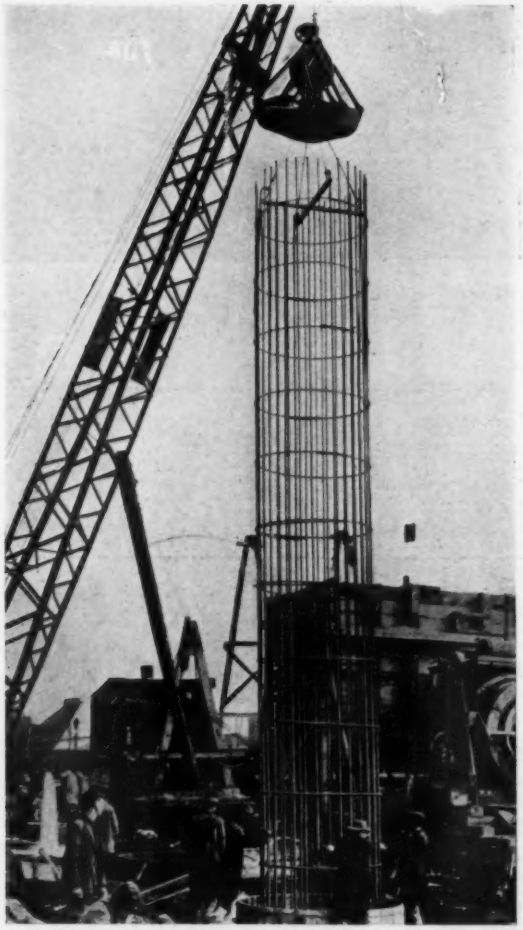
Number of Piles	Angle of Bend in Web of Steel Pile	Diameter
18	0 degrees straight web	73"
16	4 " bent web	5' 4 15/15"
14	7 " " "	4' 8 13/16"
12	11 " " "	4' 11/16"
10	17 " " "	3' 4 9/16"
8	26 " " "	2' 8 7/16"
6	21 " " "	2' 3/8"
4	90 " " "	Four 90 degrees bends

Cylinders of 8, 12 and 14 piles of bent web piling and cylinders of 18 and 20 piles of straight-web piling were used. In these cylinders 1,296 tons of piling in 33-ft. lengths were used. The piling remains permanently in position as part of the structure. The accompanying plan shows the general arrangement and size of the piers.

The pier foundation work consisted essentially in driving closed cylinders of sheet piles, excavating the enclosed material by jetting it out, and filling the opening left with reinforced concrete. The construction of these cylindrical piers is novel and original, both in design and execution. Two cableways with two portable timber towers 70 ft. in height, built on skids, were placed over the center lines of two rows of piers and were used to handle the piling, timber mast, steam pile driving hammers, wooden assembling tower, etc.

A timber pile was first driven on the exact center

SHOWING TEMPLET AND CENTER STEEL PIN



PLACING REINFORCED STEEL CAGE IN CYLINDRICAL WELL

of each pier. These piles were later dressed at the top and a hole bored at the center of pier. Excavation proceeded around this pile to a point near the water level, when the lower templet was set in position and secured to the center pile. The timber assembling tower was then placed over the lower template, and the upper template and guide ring were centered in this tower in correct position over the lower template.

The steel sheet piling was handled by the cableways and assembled one piece at a time around these templates, the cableway being of sufficient height to raise the pieces above the 33-ft. sheeting already assembled. Thus, the piles could be interlocked at the top. The position of the cableways also permitted all of the piles in one cylinder, or all the cylinders in the row, to be assembled.

This method of assembling allowed the entire cylinder to be set and held vertical, and the closure pile assembled for its entire length. A 14 x 14-in. wood mast, 43 ft. long, was then mounted and held in position on top of the wooden pile by a 2-in. steel pin. This was guyed at the top by four ⅝-in. wire cables, the mast being free to move within the top template.

A No. 7 McKiernan-Terry steam pile driving hammer, weighing 5,500 lbs., was lifted by the cableway and supported from the mast by a steel A-frame so designed as to allow the hammer and frame to slide freely upon the mast. The mast was free to revolve, and the hammer was offset from the mast the required distance to bring it centrally over the pile walls. The hammer was lowered or raised by a set of double blocks provided on the side of the mast above the hammer, the power line passing over a sheave in the top of the mast to the stationary hoisting engines.

Two sheet piles were driven by this steam hammer about 3 or 4 ft. Then the hammer was raised and placed upon two adjacent piles, driving them about the same distance. This operation was repeated until the entire circle was driven into bedrock. The average time of driving was about 6 hours for each

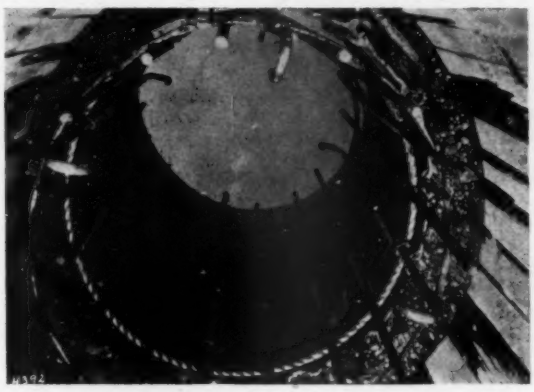
DIVER ENTERING CYLINDER TO EXAMINE ROCK SURFACE

cylinder. A large portion of this time was required to drive the piles through the glacial drift and into the disintegrated top of bedrock. Penetration into rock as closely as can be determined from original borings was from 6 to 18 inches. The work of assembling and driving the cylinders was entirely completed in a total of about 70 working days.

A multiple-stage centrifugal pump with a capacity of 1,500 gal. per min. against a pressure of 125 lb. per sq. in. was installed on a timber pile trestle on the shore of the river. An 8-in. main with a 6-in.

distributing pipe carried the water close to the cylinders. A sand jet pump constructed with a 6-in. pipe about 40 ft. long, having an elbow at the top, and a right angle pipe 10 ft. long (with two water jets fastened to opposite sides of this pipe) was used as a water jet pump. The two pipe jets had reducers at the lower end. One 2½-in. reducer was turned upward and toward the center of the bottom of the 6-in. pipe, the other 1½-in. reducer was straight and extended about 12 in. below the end of the larger pipe. These jets had the effect of stirring the sand and forcing it upward through this larger pipe. To complete this pump a 2-in. pipe connection was made in the elbow, directly opposite the horizontal piece of 8-in. pipe. These three jets were connected to the pump by fire hose.

The pump thus assembled was raised by the cableway and stood vertically in the material within the cylinder, the upper end of the 6-in. tube being closed by a gate valve. The water was then turned into the jets, and as the only avenue of escape was through the bottom the pump rapidly settled under its own weight to the bottom of the cylinder. The gate at the top of the pump was then opened and the pressure from the jet caused a large stream of sand and water to be discharged. This method of excavation proved to be so rapid that only 2 hours were required to remove all the sand, the loose material from a cylinder. An independent jet was used

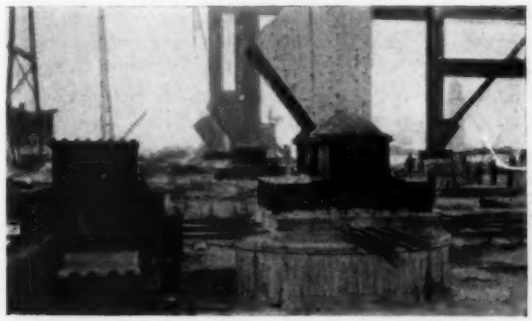


LOOKING DOWN INTO CYLINDER
Rain water collects on top of concrete

to clean the sand and material from near the walls of the cylinder. Circular wooden forms were bolted to the top of the steel cylinders to permit the spoil to be used to raise the general ground level.

To remove hard clay conglomerate, heavy gravel and boulders remaining in the cylinder, a 14-in. arched web 35 ft. long, weighing 1,425 lbs., was hung inside and used as a vertical battering ram until the hard formation was broken up so that it could be removed by a small orange-peel bucket. The final operation in cleaning bedrock inside the cylinders was to replace the large jets by 2-in. jets, one operating vertically, the other horizontally. These carefully washed the rock and the degree of cleanliness of the bottom was thoroughly tested with a sounding rod.

After inspection had proved that the rock was clean and ready for concrete, the jet pump was removed and a cage of reinforcing steel, previously assembled, was lowered into the cylinder. These steel cages were provided with stub guides which



CLOSE-UP OF COLUMN FOOTINGS
Showing reinforcing steel at floor beam level

held them in proper position relative to the sheet piling forming the cylinder shelves.

Concrete was chuted to the hopper of an ordinary tremie pipe which deposited it on the bottom. The tremie was hoisted and sections of it removed as the level of the concrete rose. The lower end of the tremie was maintained from 1 to 2 ft. below the surface of the concrete. It was operated with extreme care so as never to lose its seal in the concrete nor its charge of concrete.

By this method each cylinder was filled with concrete to a point 2 to 3 ft. below the top of the sheet piling. After allowing sufficient time for the concrete to set, water was pumped out of the top to the level of the concrete, and the laitance (usually 2 to 3 in. deep) was removed.

The wooden forms were then built for the cap of the pier and the reinforcing bars required for the floor beams were placed in position. All the concrete for top and caps was poured at one time. The reinforced concrete caps of piers were 2 ft. larger in diameter than pier. The steel sheet piling, therefore, carried part of load on pier.

This work was designed by the Stone & Webster Engineering Corporation, Boston, Mass., and was executed by the Stone & Webster Engineering Com-

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pany, George Q. Muhlfeld, Construction Engineer, S. L. Shuffleton, Western Manager in charge, and E. C. Macy, General Superintendent. H. G. Stott was Consulting Engineer for the Buffalo General Electric Company.

Upon the completion of this power house, the contractors moved their forces and plant to the site of the Philadelphia Electric Company's power house, Philadelphia, Pa.

These foundations of the boiler house and coal tower unloader were constructed in an almost similar manner to the foundations of the River Station of the Buffalo General Electric Company. They differed in the number and size of piers, however, there being but four rows of piers, of seven piers each under the boiler house and four piers only under the coal unloading tower, all these on centers of 37 ft. and 25 ft. These piers were about 14 ft. in diameter or larger and made up of 38 or more pieces of Lackawanna 14-in. arched-web piling in 37 to 55 ft. lengths.

This foundation was constructed on the site of an old shipyard with old timbers and timber piles buried in the old ship ways. At the center of each pier a timber pile was driven. In this pile at the exact center of pier was bored a 2-in. hole to receive the pier at the bottom of the timber mast. The ground timber templet was then carefully placed and held securely. After the upper templet was set and held, the steel sheet piling was assembled and the timber mast was placed, set and held at the top by steel cables, after being carefully pumped.

The hammer drove two piles a few feet at each driving. Then it was raised and placed on adjacent piles, continually driving in this manner until the cylinder of sheet piling was finally driven to bedrock.

In cylinders of steel sheet piling, the length of steel should be such that when driven into rock the top of steel cylinders should be as nearly as possible at the level of low water. The design of the pier should contemplate a reinforced concrete cap of larger diameter than the sheet piling cylinders so that the piling can be figured in the bearing value of the pier.

The New York City specifications for bearing values of steel shells of this character were given in a previous article on foundations, appearing in THE AMERICAN ARCHITECT, November 3, 1920.

A careful analysis will show that one large cylinder of steel sheet piling, with possibly some reinforcement, will simplify any foundations where otherwise a cluster of bearing piles is required. It also has the advantage of having a large area in bearing on bedrock which has been examined and cleaned.

The simple method of assembling, the driving in one operation, the necessity of one excavation only, the ability of steel sheet piling to conform in its bottom edge to the rock surface, the examination of the rock surface by steel ram or diver, the ability of cylinders to retain their cylindrical shape even though excavated in wet to considerable depths, and the trueness of a cylinder so that a cage of reinforcing steel or steel bracing can be lowered through the water and the cylinder pumped out when bracing is placed, make this form of foundation elastic, and economical both in design and execution.

Fire-Protective Materials for Steel Columns

TESTS on the fire-resisting qualities of various kinds of protections for steel columns have recently been conducted by the Associated Factory Mutual Fire Insurance Companies, the National Board of Fire Underwriters and the Bureau of Standards.

The results of these tests show that the period of resistance for an unprotected column is only ten minutes. Solid columns partly protected by filling the re-entrant spaces with concrete to the extreme of the metal stood up from one-half to three-quarters of an hour, while open-latticed columns under the same conditions stood up from 2 to 3½ hours.

The best protective results were obtained with a limestone or calcareous gravel concrete covering to a depth of 4 inches. All the columns so protected withstood the eight-hour fire test, and, while hot, sustained such large additional loads as to justify the conclusion that in the lower range of results with similarly protected columns the working load will be maintained during an eight-hour fire period.

Common surface clay brick laid on side to form a solid protection about 4 in. thick resisted fire for a period of five hours and proved to rank second to concrete in this respect.

FIRE RESISTANCE PERIODS DERIVED FROM TEST RESULTS.

Type of Column	Protection: Material	Protection: Details	Min. Sq. In. Solid Mat'l	Inches, Thick. of Protection	Period Fire Res.
Struct., steel	Not protected.	Min. thick. of metal 2".	8	..	10 min.
Struct., steel, solid	Partly protected by filling re-entrant space with concrete.	Mixt. 1:6. Vert. and horiz. steel ties.	60	..	¾ hr.
Struct., steel, open lattice	do.	Mixt. 1:6. Filling ends to outside rivets and covers lattice and main members.	120	..	3½ hrs.
Struct., steel	Port. cement plaster on metal lath.	1:1-10:2½ Port. cement, hydrat. lime, sand.	80	2 layers, each ⅞"	1½ hrs.
Struct., steel	Conc., limestone or cal. gravel.	Mixt. 1:6. Conc. tied.	200	4	8 hrs.
Struct., steel, solid	Hollow tile surface clay, hollow tile fill.	Motor joint bet. tile and col. flanges and webs, metal ties in horiz. joints.	240	2 layers, each 2"	3 hrs.
Struct., steel	Common brick, surface clay.	Brick laid on side.	240	3¾	5 hrs.

Current News

Happenings and Comments in the Field of Architecture and the Allied Arts

American Architects Invited to Exhibit in Paris Salon

Through the courtesy of Monsieur Maurice Casenave, Director General of French Services in the United States, an invitation has for the first time been extended by the Société des Artistes Francais to the American Institute of Architects to make a comprehensive exhibition of American architecture at the Paris Salon which opens in May, 1921. The drawings will be selected by the Committee on Foreign Building Cooperation of the Institute acting as a jury. While this exhibition is gotten up under the auspices of the Institute, it is open to any architect in the country irrespective of Institute membership.

A charge of $1.50 per square foot on drawings accepted will be made to cover cost of crating, storage, hanging, etc., the French Government paying the expenses of transportation to and from Paris.

Insurance on exhibits can be arranged for by the Committee from the time of their departure from New York until their return at the rate of $1.50 per hundred dollars if desired by exhibitors.

To allow sufficient time for transportation to France, the date for submission of exhibits has been set for February 14.

Those desiring to exhibit should apply to Mr. Julian C. Levi, secretary, 105 West 40th street, New York City, for entry slips which must accompany all drawings.

Brangwyn to Decorate Missouri Capitol

Frank Brangwyn, the English painter and etcher, has accepted a commission to decorate the dome of the state capitol in Jefferson City. The Kansas City *Times* discussing the matter believes that if any painter has found the poetry of industry, it is Brangwyn. He never has looked upon painting as the toy-maker's art, to provide trifles or even treasures to gratify individual whims and fashions. The picture market never appealed to him. His work, whether in separate canvas or as a part of an architectural scheme, is always decorative in idea, never wholly divorced from architecture, but obedient to a scheme of line and color as music is obedient to counterpoint and harmony.

Brangwyn's father was an architect, which may account for the structural quality of his painting ideas. And yet he did not develop his gifts directly under his father's influence. William Morris helped him, but he was shaped far more by his love of life in its more vigorous aspects.

In the work he will do in the Missouri capitol, he will have free scope and large spaces in which to express himself.

The "eye of the dome," which is assigned to him, measures eight hundred square feet, and the four other spaces he is to fill with mural paintings are each 650 square feet in size. Each painting will be more than thirty-eight feet square.

Westminster Acknowledges American Gift

The Carnegie Endowment for International Peace has received from Herbert E. Ryle, Dean of Westminster, a message of thanks for the gift of £10,000 toward the restoration of Westminster Abbey. The letter, which was made public by Dr. Nicholas Murray Butler, chairman of the division of intercourse and education of the endowment, read, in part:

"The great American people has always had a warm affection for Westminster Abbey, and I rejoice to know that this inheritance from early centuries of English history is felt to be one of those most hallowed pledges of brotherhood which help to unite the two great nations in enduring harmony and good will."

Similar messages of acknowledgment are announced by the endowment from Rheims and Belgrade, where the endowment is erecting libraries to replace the structures destroyed by the German and Austrian armies.

The Neglect of the Back Door

So much has been said about the beauties of old Colonial doorways, the fan-lights, the panels, the knockers and the antique porticos, that the unobtrusive and homely back-door has been grossly neglected. There is, however, a charm, an individuality, and a human touch about the humble back door, which the stately front door can never claim, writes E. G. Babson, in the Boston *Transcript*. The back-door and its environs tell the story of the occupants of the house. Here is one doorway, with a neat little mat outside for the iceman or the grocer boy to wipe his

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feet on (he never does, but it shows aspiration); the door-steps are swept daily, the garbage can underneath is in a good state of preservation, perhaps even fenced in. The well-washed dish-towels hang in an orderly row, and the empty milk bottles fairly gleam with cleanliness.

By contrast look at another picture; a broken screen-door, dirty steps, dented-in garbage pail, with cover half off; odds and ends of old cloths hanging up to dry, and broken flower-pots cluttering up the back porch. No invidious reflections are intended to be cast upon those responsible for this latter picture. They may be possessed of all the Christian virtues, but they have acquired an indifferent attitude to the effect of their back-doors on the neighbors. So much of women's time now is spent in the kitchen, why not make the back doorway a place of beauty?

From the back door in the small town or suburb one can see much more interesting signs of life than from the front, which merely shows humanity on parade, as it were. But from the back porch, as I write, I see activities of all kinds; hens in one yard, happily enclosed, and with no four o'clock rooster, visible or audible (Allah be praised!); a doghouse, tenanted by a fairly amiable non-growling canine, several garages and two beehives. Busy housewives are shaking mops and dusters from their back doors, and we exchange a few words on the nobility of labor. Our ashcans, although badly dented, compare favorably with our next-door neighbor's which have lost all semblance to a cylindrical shape. We view our new clothes-line with pardonable pride, and let our eyes wander speculatively to our neighbor's Monday wash, hung out in all its expansiveness. Ah, we draw a veil, but back-door life is interesting—it has the human touch.

Traveling Exhibits of Art

To inaugurate a movement to increase art appreciation among Americans, the American Federation of Arts has launched a series of exhibitions. Beginning with a collection of 400 prints in color and photographs suitable for home decoration recently shown at the Sage Foundation Building, New York, this series will ultimately embrace other items of home decoration such as wall paper, pottery, etc.

A first exhibition of this kind shown last season formed the inception of a campaign for improving home environment on the principle that a picture in the home is a silent partner in cultural growth. That any national organization should make a country-wide effort under the slogan "Art in Every Home" is a novelty in American Life. Yet under this significant motto the Federation, which has 250 chapters in 38 states, has grouped a series of traveling exhibitions, all bearing on the single purpose of improving home furnishings.

The original exhibition of prints met with such success that two others had to be arranged at once to meet the demands of societies and institutions in different parts of the country.

New publications of American prints have increased so rapidly that a complete revision of the original collection has now been made. These have been selected by a jury of experts. Every taste and fancy of the individual may be satisfied in this exhibition; history, chivalry, love, the home, childhood, music, patriotism, nature in all forms, figure, landscape and sea subjects, in fact, subjects eminently suitable for every home are there. All rooms in the house are taken care of—living room as well as chamber; the boy's room or the girl's room; the den or the nursery. The great majority of the 400 subjects on view are reproductions of works by American artists. There is also a small group of foreign subjects, as well as a number of reproductions of famous paintings by old masters. The prints are in various sizes and finishes, and suitable for framing and immediate use.

New reproductions have also been added from works privately owned.

There is also an exceptionally good series of photographs, among them a selection from paintings in the Metropolitan Museum of Art published by the Museum as part of its extensive educational work.

A most interesting feature of the exhibits is that the Federation will sell at the exhibition rooms copies of all the prints exhibited at prices from 35c to $18, demonstrating the wide range of selection and the fact that there are offered excellent reproductions at prices that readily accommodate themselves to the size of any home-maker's purse.

The exhibition will form one of a number on tour throughout the country under the direction of the American Federation of Arts; 46 exhibitions of paintings, prints, crafts, war memorials, architecture, etc., being on the road all the time, each being shown in a different city each month.

Factory Machinery No Longer Black

Twenty-five years ago little thought was given to the interior of factory buildings; "sanitation" was an unknown word; proper lighting, health and care of workers were not considered. Today there are very few factories, prompted by the wish for higher efficiency, that do not have interior walls and ceilings finished in white or some other light color.

And it is little over five years ago that careful thought was given to the question of proper lighting

of working areas at night, and in such plants where the nature of the business required very high ceilings and the effect of white walls was not so pronounced, as would be the case in foundries, etc. This led to a careful study of suitable lighting fixtures for such plants and was followed by the development of suitable lighting fixtures for factory buildings of all kinds. Today more and more attention is given to proper illumination for the dark hours of the day and for night work.

Clean, healthy surroundings, fresh air and proper lighting are now the rule and help greatly in insuring the contentment of workers and steady production which will pass rigid inspection.

Today progressive manufacturers are completing the triangle of bright factory conditions by adding to the light walls and the proper lighting fixtures brightened surroundings to the very machine on which the workers are employed. These manufacturers have found that by doing away with the black color so common on machinery and substituting for it a bright, pleasant color they lessen the eyestrain of the worker, do away with his restlessness at the job and materially reduce spoilage.

One company through extended tests along this line has proved conclusively the advantage of light-painted machinery. When given the privilege to choose from machines finished in different colors, all the employes desired to work on the machines finished in the lighter colors. A light gray color has been proven satisfactory because this color is sufficiently off the white light to prevent undue glare and sufficiently light to eliminate dark shadows.

A Silencer for the Street Noises

One of the disadvantages of city life is its noisiness. The larger the population the more kinds of noises there are and the greater is its volume. Most people would gladly escape from it, if to do so were possible.

Hence the advantage of a contrivance invented by Hiram P. Maxim, which has for its object the eliminating of street noises from buildings. It is meant, especially, for apartment houses, hotels and hospitals.

Having effectively muffled guns with his silencer, Mr. Maxim has turned his attention to the hubbub of our city streets.

Of course, nobody can get away from noise who opens his windows upon the streets of a town. Hence it is that Mr. Maxim's invention seeks to do away with the necessity of opening windows for ventilation. He proposes to supply from the roof all the fresh air that is wanted, using machine driven fans to draw it down through the halls and into the rooms.

In order that the air may not bring sound vibrations with it, resort is had to the expedient of silencing it. For this purpose there is erected on the roof of the building a circular structure which has a spiral interior. But it is a broken spiral, and the passage of the air drawn down through it is further interrupted by twists and turns, so as to break up all noise vibrations. It is further suggested that the silencer here described might be lined with felt or some other sound-deadening material.

There are familiar means for making walls soundproof, so that, in an apartment house or hotel, nobody ought to be annoyed by the noises of his neighbors. In a properly constructed building, then, the occupant of a room should be able to get rid of all noise by simply closing the windows, and this he can do without shutting off the fresh air supply if Mr. Maxim's silencer is in use.

Fighting a Burning Coal Mine Under a City

There is a coal-mine burning under one of Pittsburgh's most exclusive residential sections. The fire started in 1914. A few months later, it is learned from the *Popular Science Monthly*, it spread rapidly and became a source of great danger to the community. To know that a fire is burning under the street you live on, with the possibility that it may actually extend under your home, would not add anything to your feeling of comfort and security.

The people in the Squirrel Hill section of Pittsburgh, where the fire occurred, did not give the matter much thought until the street above the burning mine became so hot that pedestrians were unable to walk upon it. The street was completely undermined by the fire, and part of it caved in.

This was no job for the fire department. Putting out mine fires is a job for engineers. Water could not be used, and it would not do any good even if it were possible to apply it.

When the city engineers reached the fire and studied it, they decided to dig down a short distance and build a clay wall or barrier beyond which it would be impossible for the fire to spread. This plan was put into effect, and it was thought that the fire would soon burn itself out. But the engineers were disappointed. The fire did not burn itself out. It grew hotter and hotter. The heat caused the clay wall to crumble, and the fire spread rapidly to thicker coal deposits.

There was another hurry-up call for the engineers. This time they decided to strip the vicinity of coal as far as possible, and steam-shovels were put to work. The excavation was carried on with great haste to prevent the fire from spreading to sections forty feet beneath the surface. To permit the fire

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to reach these areas meant almost complete disaster to the entire community. It was very difficult to fight the fire at depths varying from ten to twenty feet. At a depth of forty feet, effective work would have been almost impossible.

The race with the fire continued for some time. Steam shovels dug frantically. Coal became so plentiful that it was sold to the people in the neighborhood for one dollar a ton. At times during the operations burning portions of the mine were exposed. Although the fire was subdued to a great extent, it was not entirely extinguished. The battle with it is still being waged.

The coal-mine in which the fire started is a very old one. It has been abandoned for forty years. The fire received its necessary supply of oxygen through several openings. It is difficult to imagine how ferocious a coal fire may become, burning underground. As the oxygen is used up in the combustion of the coal, a partial vacuum is created. This lowering of pressure causes air to find its way in from the outside and the fire never lacks a fresh supply of oxygen.

Coal-mine fires are not uncommon, but they usually occur in unpopulated districts, where they are allowed to burn themselves out, owing to the great cost of extinguishing them. A coal-mine burning under a city is a more serious matter—it simply must be put out regardless of cost and trouble. If it is allowed to reach deposits that extend beyond a certain distance underground, the job of putting it out becomes well nigh impossible. The use of dynamite is bad. It loosens the coal and offers more fuel for the fire.

Indians Had 45-Story Apartment House

The discovery of a stone apartment building, forty-five stories high and containing one thousand rooms, believed to have been the home of a now extinct tribe of American Indians, was announced at a meeting of the Archæological Institute of America at Johns Hopkins University.

The apartment was uncovered in one of a group of towns representing an ancient civilization in the midst of the Southwestern Desert. Several thousand persons may have lived in the newly discovered building.

Find a Fine "Rembrandt"

An interesting discovery has been made in a little half lost village in the Harz Mountains. In a house there, states the New York *Times*, a picture in oils of an aristocratic old gentleman has been hanging for many years. It was only a little while ago that the owner thought it might be of value, and made the discovery that the picture was by Rembrandt. Several experts say there can be no doubt that it is by the famous Dutch master.

The picture is painted on an octagonal piece of oak, about two feet high by one and one-half feet wide. It still is in its beautiful original frame and one of the experts, Dr. Hofstede de Groot, declares that the frame must have been made at Rembrandt's special instructions out of Scotch fir. The work dates from the time of Rembrandt's stay in Leiden and probably was painted in 1630 or 1631. The initials R. H. L., which stand for Rembrandt Harmenzoon Leiden, appear in a typical monogram above the shoulder. The discovery was made by Egon Mueller, a well-known art expert of Hamburg.

Personals

Edward F. Stevens, 9 Park street, Boston, and Frederick C. See, 62 Clark street E, Toronto, architects for medical institutions, have officially announced the formation of a partnership at the same addresses. They have been associated for a number of years.

R. S. Tyson and H. N. Foster announce that they have taken over the office of Mr. J. M. King and will practice architecture under the firm name of Tyson & Foster, with offices in the Woods Building, Ashland, Kentucky.

James H. Ritchie, architect and engineer, formerly located at 8 Beacon street, Boston, Mass., has associated himself with F. R. Jonesburg, and the firm is now operating at 15 Ashburton place, that city. They also have an office at St. Petersburg, Fla.

Herbert C. Hearne, architect, who formerly practiced at 145 State street, Springfield, Mass., is now located at 356 Main street, that city.

Bowen, Bancroft Smith & Geo. Provot, architects, announce that they are now located at 48-50 West 47th street, New York City.

James Kleinberger, architect, is now located at 20 West 43d street, New York City.

Edward Fanning, architect, is now with Goodwin & Woolsey, 4 East 39th street, New York City.

Charles Volz, architect, announces that he is now practicing at 371 Fulton street, Brooklyn, N. Y.

L. R. Barber, architect, has just been discharged from the army and opened an office at 325 Guarantee Trust Building, Atlantic City, N. J.

Weekly Review of the Construction Field

With Reports of Special Correspondents in Regional Centers

A STUDY OF PRICES*
By
EDMUND D. FISHER
(Vice-President, Bank of Detroit)
PART II

[Refer to Page 107, Issue of January 26, 1921]

THE credit swing in prices, however, is the one that is most unsettling to the business world. The movement has been frequently called a "financial cycle." Prior to the organization of the Federal Reserve System the financial cycle seemed to be permanently established as a reoccurring factor in American business life, although each succeeding period had certain characteristics peculiar to itself, which frequently tended to deceive even the veteran business man.

Common to all these periods, however, was a period of inflation, followed by a period of deflation. Such a period was invariably characterized by a crisis year, one or more dull years, culminating in a number of active business years. These active business years were followed by another period of readjustment, included in another financial cycle. As the active years were years of increasing prices and years of growing inflation, it is evident that during these years there were committed the economic errors which were ultimately disturbing to trade and necessitated readjustments of prices and policy.

AVERAGE PRICES 1914-1919
(Annalist Index Number Showing Varying Prices)

1914	146.069
1915	148.055
1916	175.720
1917	261.796
1918	287.080
1919	295.607
Nov. 13, 1920	238.557

The period commencing with the World War in 1914 is illustrative of such a period of inflation, whose effects were world wide. The new and abnormal spending power of the various governments, growing out of non-liquid loans, fiat or quasi-fiat currency issues, and increased taxation, "bulled" prices. Business men bid against each other in supplying raw material and manufactured goods to meet war demands. Labor received increasingly higher wages and came into the market for luxuries in abnormal volume. Bank loans increased, following the necessity for increased capital, to build new factories, and to finance the growing dollar volume of trade. Population of cities increased, weakening the primary basis of production. The normal relations of production, manufacture and distribution were disrupted. Much of the wealth produced was non-productive and fed the fires of war. Yet all these tendencies which made for an inevitable readjustment were more or less obscured for a while, and the feeling developed in the United States that the nation was growing wealthy. People were certainly busy, but finally began to feel through the strain of increased prices that it might be a period of lessening wealth.

Theoretically it is possible to conceive of prices remaining relatively stable during a war period, if the buying power of the people were restricted through saving, offsetting the increased buying power of the government. Practically, however, the people do not save the necessary amount for this purpose. The government, therefore, continues to borrow heavily, bank loans expand and the added spending power thus created stimulates the increase of prices. As a consequence, of course, the value of the dollar itself tumbles.

THE rather comprehensive subject suggested for this address includes in addition to the reasons leading to advance in prices—"What is necessary to bring about their orderly decline." As the phrase is, "There ain't no such animal." That is, yet to be found in the American financial zoo. It could not live with the "bulls" and "bears." An orderly decline in prices must follow a preceding period where business is well under control, where reserves are laid aside to break the shock of future changes, where inventories are not too large, where new equipment and new factories are planned for an average rather than an abnormal business, and where there is a potent economic control working through the entire financial cycle by a strong central banking organization. In the past many European countries have had such relations fairly well established, and where the credit cycle has had no extremes in price movement.

English experience ranging over a long period of years shows that the credit cycle of prices very nearly coincides with the average annual discount rate of the Bank of England. As prices go up the discount rate advances. As prices go off the rate declines. The economic control of the bank over prices is thus made evident. This condition is particularly interesting in view of the power of the

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Federal Reserve System to control discount rates in the United States through the principle of rediscount for member banks of approved commercial paper. This power was not exercised during the war period because it was deemed wise to help government financing through the maintenance of a low interest rate. Furthermore, the gold reserves of the Federal Reserve Banks were comparatively strong, owing to the great influx of the precious metal from abroad, sent in payment of foreign purchases, chiefly in 1915, and the substitution of credit balances for money reserves in the member banks of the country. The conditions thus established, of course, were elements of inflation, particularly as the Federal Reserve Act provided for lessened reserves in the national banks.

Under normal international conditions the advance of the discount rate of a central bank tends to draw capital from foreign countries and offsets the necessity of gold exports. It tends generally to minimize bank loans and promote liquidation. The effect of this policy, as we have seen, is to promote the reduction of commodity prices. On the other hand, a reduction of the discount rate would tend to increase loans, tend to stimulate enterprise generally, and ultimately advance prices. The proper function of a central bank, or of a central board with corresponding power, is, of course, to stabilize prices so far as possible and to minimize the ups and downs of credit movements. Such movements, however, are more or less inevitable, growing out of the inherent errors in business life.

Recently, the rediscount rates of the various Federal Reserve Banks have been advanced. This action was followed by a tendency to curtail credit by the member banks, with the consequent reaction on the price fabric of the country. In general, therefore, it cannot be claimed that in this particular credit cycle, the Federal Reserve System has acted as a stabilizing element; but it is now functioning along approved lines, although somewhat late, and should prove to be an important factor in approximating an orderly decline in prices.

THE chief element which has caused our present inflation, our great government debt, is likely to remain a non-liquid element in our banking and currency fabric for some time to come. This suggests that a large amount of inflation may remain in our price schedules and only be eliminated as the debt is gradually paid or absorbed through the savings of the people. It will be remembered that prices following the Civil War, with some erratic exceptions, declined very gradually for a long period of years. The changes are shown in the following index:

1864—249		1872—153
1865—229	(Peace established)	1873—147
1866—206		1874—143
1867—192		1875—135
1868—186		1876—120
1869—170		1877—116
1870—155		1878—100
1871—152		1879— 99

(Resumption of specie payments)

The business world has no guide to point to future price movements, or determine a sane reduction from year to year. Prices will brook no control—they look out for themselves and are really the governors on the machinery of business, if not interfered with by governmental price-fixing schemes or trade agreements. It is possible that price-fixing may be justified during a war period, but from an economic standpoint the price tendencies are stronger than the forces of governmental or trade regulations. Fixing prices during a decline would be very difficult, although theoretically possible under seasonal readjustments.

A merchandising concern that does an annual business of seventy-five millions of dollars has taken an attitude which emphasizes a seasonal basis of prices. It is announced that they have begun their spring buying in lines where the manufacturers have been able to standardize prices. It is pointed out that business and confidence must be re-established, and that it devolves upon the producer to set prices which he can stand by. The statement in part says:

> "Labor must be kept employed; mills throughout the land must be heartened by real orders to set in motion wheels already stopped, and to speed up those that are running.
>
> "No sane manufacturer will at this time make goods without orders; because, however carefully he figures, he would have to force the goods for sale if they did not move quickly, and pocket new losses.
>
> "Prices are not done coming down, though some lines have struck the cellar, and must rebound a bit to reach a live-and-let-live basis. But a start must be made somewhere to re-establish business and confidence. The pessimist will create worse havoc if the optimist does not prevail over him."

(To be concluded.)

(Special Correspondence to THE AMERICAN ARCHITECT*)*

SEATTLE—Stabilization of prices and conditions continues very favorably here. The steel market has invited the confidence of investors and builders during the past month. Architects report a more definite inquiry as to costs. Pencil sketches are rapidly multiplying. Lumber is acting sympathetically with steel, and is now on a new lower operating cost. Increased production by labor is chiefly to be credited.

With labor generally producing at normal capacity,

it is felt that the spring building season on the Pacific Coast will gradually improve.

Sheet metal is meeting the Steel Corporation levels, and there are sufficient stocks on hand for present or early spring requirements. The railways are now handling the bulk of the stock in transportation, intercostal water transportation having proved rather unsatisfactory. Pipe arrivals and deliveries are considerably improved. All sizes are available. The jobbing trade expresses the opinion that the situation is now satisfactory.

Seattle architects estimate this week that it will require an expenditure of $125,000,000 to meet Pacific Coast building needs, and that $50,000,000 spent on construction in this city alone would not overbuild it. Architects who are willing to go on record on this statement are firmly of the opinion that every essential item in the construction line is now at a reasonable basis, including labor. This city is three years behind in Class A office buildings. A number of old office buildings await remodeling to be brought to a modern revenue-producing level. There is also a great need for Class A apartment houses. Architects are recommending that this type of construction be henceforth six and ten stories in height, with most modern equipment and roof gardens. There is a great need for hotels, an auditorium, hospitals, a temple of music and more school buildings.

Methodists of this North Coast territory are gathering funds for a $1,000,000 hospital, which they hope to build in this city within the next two years. Congress has been asked to appropriate $1,000,000 for a new immigration station at Seattle, and owing to the urgent need for such a structure, it is believed here that the congressional budget will include an appropriation for it.

The "Own-Your-Home" campaign is on in Seattle this week. Posters are everywhere. Literature prepared by the Seattle Real Estate Association is being spread broadcast. Motion pictures are also being utilized in the campaign of publicity.

Fir lumber wholesalers are refusing to sell short on this market, indicating better confidence in futures than was shown during the last quarter of 1920. Reduced log and labor costs, it is conceded, will bring a recession in the market in big timbers used in railway construction, but will not be reflected in the building industry. Progress is being made in securing water rates intercostal for hauling Fir lumber tonnage into the Atlantic seaboard and southeastern territory, and with $18 from Puget Sound to New York as competition, the railways announce that a rate of 95 cents per hundred pounds may be expected early in March. Should the overland lines name this figure, it is certain that water rates will decline still further, possibly to $15 per 1,000 feet.

Average prices at which the Fir mills sold lumber during the last week mill basis were $49 for vertical grain, and $23.50 to $29 for slash grain flooring, $62 for stepping, $23 to $28 for drop siding, $15.50 for boards and shiplap, $13.50 for dimension and $18.50 for plank and small timbers. The mills are not accepting business on the present shingle price to the trade of $1.85 to $1.95 for stars, and $2.10 to $2.20 for clears, square-pack basis. The per thousand basis of quoting shingles will be permanently abolished when the mills resume the spring cutting.

(Special Correspondence to THE AMERICAN ARCHITECT)

CHICAGO—The work of last week's conference of lumber and building materials manufacturers showed practically no tangible results, and was summarized in two resolutions, the first calling upon building materials manufacturers to exert their best efforts for reductions in construction costs, the second suggesting that Congress be requested to direct its amendatory attention to those laws which interrupt the operation of natural economic laws, such as unscientific revenue acts, excess profits tax, excessive surtax on individual incomes, the Clayton anti-trust act and the Adamson law.

The public uncertainty as to building costs is at present blocking building, according to the opinions of the majority present. This is the big factor. One of the most important subordinate factors, as indicated by many of the speakers, is the reluctance of investors to take up mortgages when many tax-free investments offer much better returns. Tax exempted mortgages is one of the necessary steps in the building renaissance.

The conference looked upon the price problem as the big obstacle. This is the reason for public uncertainty, of course. There has been deflation in certain materials, but a great deal more in those materials, and in others, was held by the conference to be necessary to any sort of building program.

The meeting resolved itself finally into a general plea for everyone to get down as close to bedrock as it is now possible, so that public confidence may be secured.

Labor came in for its share of criticism, practically all present at the conference being distinctly of the opinion that the desire of the Chicago Building Trades Council to continue the $1.25 hour for union building workmen for three years was wrong. It was held that labor must take its loss with the others, or else hold up the building program or invite an open shop fight.

Speaking again of public confidence, the discussion turned to advertising. The conspicuous example of the Northern Pine Association in its "public confidence" advertising campaign was referred to, as well as the action of the paint and varnish industry in its "Save the Surface" campaign. In line with

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this policy of favorable publicity, the board of directors of the National Lumber Manufacturers' Association, the official host of the conference, decided to raise and spend a fund of $300,000 to promote public confidence in building and to do away with the "unjustified prices" criticism.

Another important item in local building is the recent indictments brought against 46 millwork manufacturers, carpenter-contractors and union leaders, alleging that the 1918 agreement which prohibited Chicago union workmen from using non-union sash, door and blinds established a virtual monopoly by Chicago manufacturers on that line of business, the open shop towns outside Chicago standing no chance in competition. It is said that the arrangement added about $3,000,000 to the annual rental bill of the city.

The manufacturers and carpenter-contractors hold that the agreement was really a war-time truce with union labor, and that they themselves would like to see the agreement abrogated.

Building here is waiting for a further shakedown in prices.

Lumber remains on fairly stable levels, with upward tendency.

Local quotations are as follows:

Yellow Pine:—B. & B. 1 in., $95 to $130; 13-16, 3¼ flat flooring, $85 to $90; 2 by 4, 10 to 16 feet, No. 1 long leaf, $51; 2 x 6, $48 to $49; 2 x 8, $49 to $50; 2 by 10, $52 to $54; 2 by 12, $54 and $56.

Northern Hardwoods, carload lots, Chicago:

Birch, four ¼ No. 1 and 2, $155; select, $130 to $138; No. 1 common, $95 to $100; No. 2 common, $60 to $65; No. 3, $35 to $40.

Hard Maple, four ¼ No. 1-2, $135 to $140; select, $115 to $120; No. 1 common, $95 to $100; No. 2, $60 to $65; No. 3, $32 to $50.

Red Gum, four ¼ No. 1 and 2, $148 to $152; No. 1 common, $88 to $92; No. 2, $43 to $47.

Birch, four ¼ No. 1 and 2, $155 to $160; select, $130 to $139; No. 1 common, $95 to $100; No. 2, $60 to $65; No. 3, $35 to $40.

Douglas Fir, 12 by 12, No. 1 up to 32 feet, $65 to $75; 14 by 14, $68 to $75; 16 by 16, $70 to $75; 18 by 18, $75 to $80.

Cement:—Universal, $3; Lehigh, $3.00; Portland, $3.00.

Bulk lime, $1.70 to $1.90; face brick, octagons, $68 to $75; fire brick, $32 to $40; 12 in. .24 to .27, 18 in. .46 to .54.

Crushed stone gravel, $3.40 to $4; lake and bank sand-torpedo, $3.40 to $4.

(Special Correspondence to THE AMERICAN ARCHITECT*)*

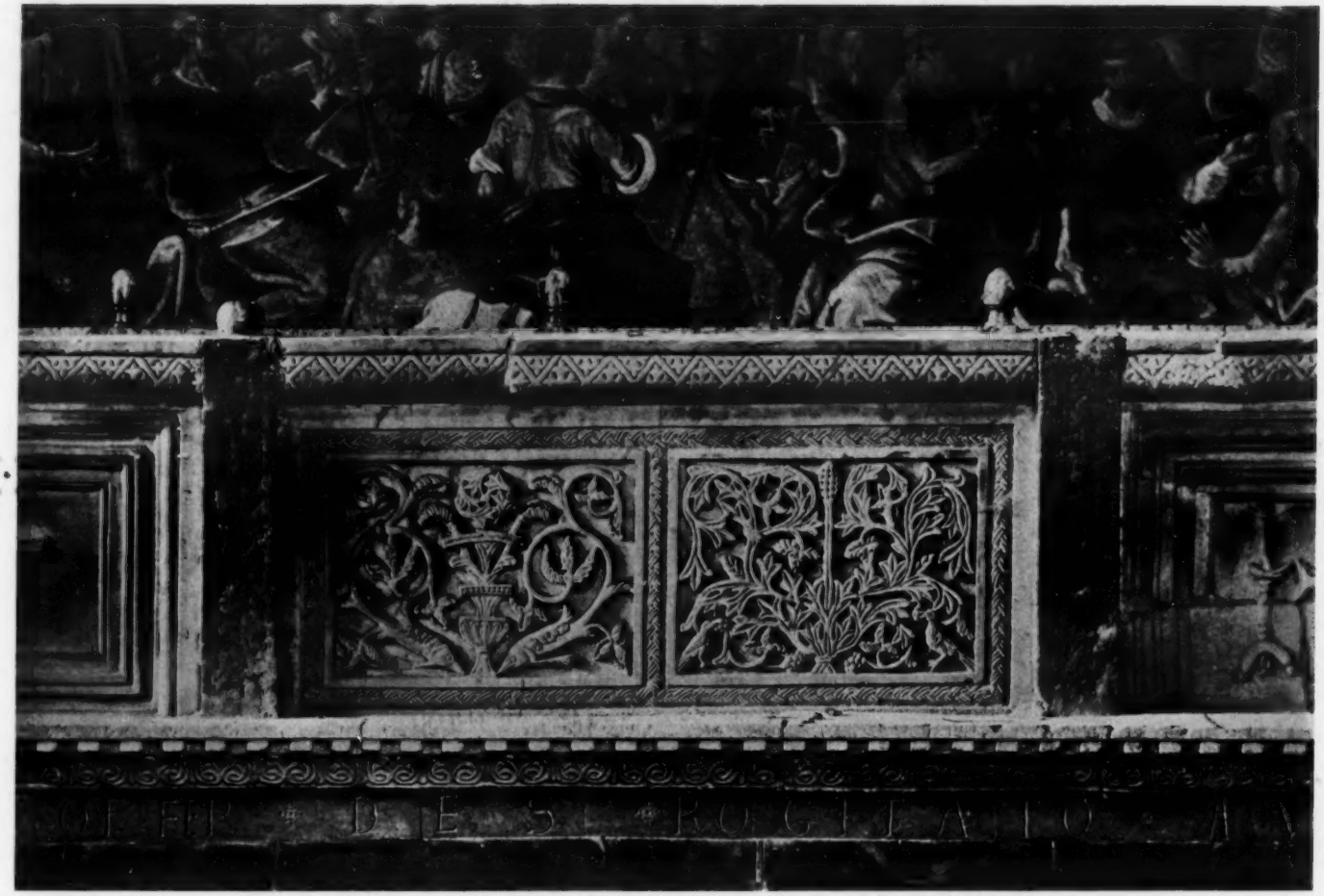
BOSTON.—Unemployment continues, a recent survey of the organized workers of Massachusetts by the State Department of Labor and Industries showing that it affects more than one-quarter of the organized workers. Labor unions reported that out of a total membership of 199,022, the number of idle was 57,420. Inactivity in the boot and shoe industry is about 45 per cent. But conditions are *really* improving.

The strike of 30,000 building mechanics in Boston, which started this week, continues. It was stated at the headquarters of the Building Trades Employers' Association a few days ago that the employing contractors were seriously considering a reduction to 80 cents an hour, 10 cents below their former offer of 90 cents. It is the opinion of many architects and engineers that a reduction to 90 cents an hour is not sufficient to stimulate building.

In some sections and industries in New England, confidence is nevertheless returning. New Bedford, Fall River and other mill cities report an encouraging flow of orders. The textile situation has definitely turned for the better. Wool showed a rebound in prices, and the volume of business is decidedly better. Some shoe factories report operation of machines which have been idle for months.

Deflation has yet to make its mark on some other lines. It is reported that several of the independent steel corporations, for instance, have cut plates this week to $4 a ton under the U. S. Steel's figure.

It is thus evident that the whole problem is one of adjusting prices in all industries to a common level, so that the products of one may be exchanged for those of another on a fair and equal basis.



DETAIL OF GALLERY PARAPET, CHURCH OF S. MARK, VENICE